

UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF NEW YORK

JOHN KOGUT,

Plaintiff,

-against-

THE COUNTY OF NASSAU, POLICE  
COMMISSIONER DONALD KANE, POLICE  
COMMISSIONER WILLIAM J. WILLETT (2005),  
POLICE COMMISSIONER JAMES LAWRENCE,  
DETECTIVE SEAN SPILLANE (HEAD OF HOMICIDE  
1985), DETECTIVE DENNIS FARRELL (HEAD OF  
HOMICIDE 2005), DETECTIVE JOSEPH VOLPE,  
DETECTIVE ROBERT DEMPSEY, DETECTIVE ALBERT  
MARTINO, DETECTIVE WAYNE BIRDSALL, DETECTIVE  
MILTON G. GRUBER, DETECTIVE CHARLES FRAAS,  
DETECTIVE FRANK SIRIANNI, DETECTIVE HARRY  
WALTMAN, P.O. MICHAEL CONNAUGHTON, P.O.  
WILLIAM DIEHL, and JOHN DOES 1-5,

Defendants.

06-CV-6695 (JS)(WDW)

JOHN RESTIVO, DENNIS HALSTEAD, MELISSA LULLO,  
JASON HALSTEAD, TAYLOR HALSTEAD, and HEATHER  
HALSTEAD,

Plaintiffs,

-against-

NASSAU COUNTY, JOSEPH VOLPE, in his individual capacity, ROBERT DEMPSEY, in his individual capacity, FRANK SIRIANNI, in his individual capacity, MILTON GRUBER, in his individual capacity, HARRY WALTMAN in his individual capacity ALBERT MARTINO, in his individual capacity, CHARLIE FRAAS, in his individual capacity, THOMAS ALLAN in his individual capacity, RICHARD BRUSA, in his individual capacity, VINCENT DONNELLY, in his individual capacity, MICHAEL CONNAUGHTON, in his individual capacity, WAYNE BIRDSALL, in his individual capacity,

WILLIAM DIEHL, in his individual capacity, )  
 JACK SHARKEY, in his individual capacity, )  
 DANIEL PERRINO, in his individual capacity, )  
 ANTHONY KOZIER, in his individual capacity, )  
 Detective Sergeant CAMPBELL, (Shield #48), )  
 in his individual capacity, SEAN SPILLANE, )  
 in his individual capacity, RICHARD ROE )  
 SUPERVISORS #1-10, in their individual )  
 capacities,

Defendants.

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## REPORT OF NICHOLAS PETRACO

I, Nicholas Petraco, hereby declare under penalty of perjury that the following is true:

I have been retained by counsel for the Restivo and Halstead plaintiffs to provide expert opinions in answer to questions relating to the forensic testing of hairs in the Theresa Fusco rape/murder case. In 1986 I testified as a prosecution witness on this subject at the trial of *People v. Restivo & Halstead*, Indictment No. 61322/1985. I was later retained by counsel for John Kogut and testified at his retrial in the matter of *People v. Kogut*, Ind. No. 61029/1985, in 2005. I am doing this case pro bono.

### **Education, Qualifications, Expertise and Experience**

For a detailed review of my background, please refer to my CV, attached as Exhibit A.

I received a Bachelor of Science in Analytical Chemistry from John Jay College of Criminal Justice in 1974. In 1979, I obtained a Master's degree in Forensic Sciences from John Jay.

For about the last thirty years, I have been an adjunct or faculty member at John Jay College, teaching courses in forensic sciences such as trace evidence, which includes hair microscopy. I am now an assistant professor there.

I started my career in 1968 as a police trainee assigned to the Firearms Control Board as a fingerprint technician for the New York City Police Department (NYPD). After attending the Police academy I was assigned to a patrol precinct until July 1974. From 1974 to 1990, I worked as a Detective Investigator/Criminalist at the NYPD's trace evidence section, where I analyzed a various types of physical evidence including hair evidence in thousands of cases. Since 1990, I have been a self-employed consultant in the field of criminalistics in cases across the United States as well as abroad. From 1999 to the present I have been a forensic consultant to the NYPD Forensic Investigation Division (FID). Currently, I am the technical leader in criminalistics for FID. My assignments include training of new criminalistics and crime scene personnel, establishment of standard operating procedures (SOP) for the criminalistics unit, designing training programs and training manuals for various categories of physical evidence, technically reviewing and the verification of criminalistics unit personnel's casework as well as participation in casework.

I served as the chairperson of the Hair Committee of SWGMAT (Scientific Working Group on Materials Analysis), a working group convened by the Department of Justice to develop guidelines for forensic hair examination, as well as training protocols for hair analysts. The group I chaired was comprised of the leading hair analysts from across the globe. Among the publications authored by this group is a comprehensive Atlas of Human Hair.

Many of the more than fifty journal articles, six book chapters, and five books that I have authored or co-authored over the course of my career involve various areas of criminalistics. Among my journal articles was a 1988 article in the Journal of Forensic Sciences, which was one of the first publications on the phenomenon of post-mortem hair banding in the literature. For a list of my publications please refer to my CV, attached as Exhibit A.

In the last four years, I have testified as an expert in approximately a dozen cases. I was retained, but did not testify, in *State of Florida v. Casey Anthony*, regarding the phenomenon of post-mortem hair banding.

### **Materials Reviewed**

In addition to the body of literature on hair microscopy and post-mortem hair banding, my examination of questioned and known hairs from the Fusco case in 1986, and my 2003 examination of color photomicrographs of those hairs taken by Dr. Peter DeForest in connection with his 1986 examination, I have reviewed the following case materials for this report:

- Amended Complaint, Kogut et al. v. Nassau County, et al.
- Deposition Exhibits:
  1. Fraas Report
  4. Trial testimony of Charles Fraas, *People v. Kogut* (2005)
- Color Photomicrographs
- Hair photos (including some trial Exs. EEE-OOO from *People v. Restivo & Halstead*)
- My testimony in *People v. Restivo & Halstead* trial
- My testimony from the 2005 retrial of *People v. Kogut*
- Materials I reviewed in connection with my testimony at the criminal trials
- Testimony of Vito Schiraldi in the 2005 retrial of *People v. Kogut*
- Petraco affidavit 3/31/2003 with attachments (IP7897-7930)
- Deposition of Charles Fraas

### **Opinions**

**Question 1: Given your microscopic examination of the questioned (Q8) hairs purportedly collected from the Restivo blue van and later identified as coming from Theresa Fusco, as well as Nassau County records about those hairs, could those hairs have come from Theresa Fusco before she died or within the brief time span between her death and her body being left in the wooded area known as “the Fort” consistent with the prosecution’s theory in the criminal trials of Restivo, Halstead and Kogut?**

**Opinion 1:** No. The Q8 hairs later identified as Theresa Fusco hairs, which were reportedly collected from the Restivo blue van, could not have been left there while she was alive or within a short

time after she died. Two factors support this finding: post-mortem hair banding and their pristine condition.

In consulting for the prosecution on hair banding issues in the Fusco case in 1986, I examined two questioned hairs that NCPD Det. Charles Fraas stated were recovered from defendant Restivo's van, as well as a series of known hairs collected from the victim at autopsy. I also examined hairs exhibiting banding in three other cases. The scope of this review is reflected in the notes I took during the pretrial consultation on October 28, 1986 (a copy of which are attached hereto as Exhibit B), as well as in my trial testimony. In my notes, the two questioned hairs are labeled "Q8A" and "Q8B," and the known hairs I reviewed are labeled "K#1" through "K#20."

*Post-mortem hair banding:* Both of the Q-8 hairs at issue clearly exhibit post-mortem hair banding, a phenomenon which looks like a dark "band" when the hairs are observed microscopically. Hair banding is a post-mortem decomposition artifact that develops on the root, and the part of the hair below the scalp, while the hair is attached to a corpse. When I first testified on this question in 1986 there were few published studies on the phenomenon.

I developed an increased interest in the postmortem banding phenomenon as a result of my involvement in the Teresa Fusco case. At the time I testified in 1986, I had observed postmortem banding in many cases, but there were only a few observations or studies on this phenomenon that had been published. After examining the two questioned hairs labeled "Q8A" and "Q8B," and the known hairs at the NCPD, I went back to my laboratory, and in the next few days examined two known autopsy specimens and a third (Chaim Weiss) from NCPD. I then presented my observations during the 1<sup>st</sup> trial.

In 1988, Dr. Peter DeForest, Charles Fraas, and I co-authored an article in the Journal of Forensic Sciences, in which we analyzed instances of postmortem banding and root changes we had observed in a number of cases, including the 8-12 hour (Chaim Weiss) case. The article published by Dr. DeForest and myself was the first major piece on the postmortem hair banding phenomenon to be published in the United States. Since its publication, I have continued to actively monitor research and developments in the field, and have been regularly consulted by other forensic scientists on the issue, both with respect to ongoing research and the investigation of individual cases. I have been sent hair samples containing known or suspected banding for review by colleagues from around the world, consulted with them about the issue, and retained many of those samples for additional observation and study over time.

The postmortem banding phenomenon has also been the subject of discussion with my colleagues at semi-annual Scientific Working Group for Materials Analysis (SWGMA) hair section meetings, in preparation for the publication of our comprehensive atlas on hair morphology that has been published on the SWGMA website in [YEAR]. These discussions further reflect the broad consensus on certain basic principles of postmortem banding among forensic hair experts that has emerged over the last 26 years.

A number of basic principles regarding this phenomenon are now established in the forensic scientific community. One of these generally accepted principles is that banding is a "postmortem" phenomenon -- that is, it only occurs while the hair is still attached to a decomposing corpse. No one has ever reported hair banding on the hairs of a living person. Not all hairs attached to a decomposing corpse will necessarily exhibit banding; banding is more likely to appear in anagen hairs (hairs in the

early and active stage of growth) and has also been seen in catagen hairs (hairs in the intermediate stage of growth, but which are still firmly attached to the scalp). However, it is recognized that when banding does appear, the hairs in question must have been attached to a decomposing corpse.

There exists a consensus in the forensic science community, that postmortem hair banding does not develop or progress after the hairs are removed from the corpse. In addition, I have personally examined hundreds of samples of hairs from deceased persons in my laboratory, for manifestations of banding after days, weeks, or months had elapsed. In none of the cases where I initially observed banding in these plucked hairs did it progress further over time, nor did any of the plucked hairs which did not exhibit banding develop it at a later time. My personal observations in this regard are consistent with reports from the community of microscopic hair examiners, insofar as the manifestations of banding do not develop or progress once hair is removed from the corpse.

There also exists a consensus that the appearance of banding is due to the formation of an air or gas pocket in the shaft of the hair, which looks like a dark “band” when observed microscopically. While more research on the precise mechanisms of causation remains to be done, it is widely believed that the air pocket or bubble is caused by degradation of the non-keratinized portion of the hair after death.

The 8-12 and 10-12 hour intervals from the 1986 cases about which I testified at the Restivo/Halstead trial, and which Dr. DeForest and I cited in our 1988 article, remain, to my knowledge, the earliest reported instances of postmortem hair banding.

It may also be worth noting that the time intervals in those earlier cases were estimates, and the actual time between death and hair removal could have been longer. For example, in the Chaim Weiss case, the 8-12 hour estimate was based on information from Det. Fraas that the victim had been seen alive at 1:30 AM and was found dead at 6:30 AM, and that the autopsy had commenced at 2:00 PM. However, hair removal does not always occur at the start of an autopsy; indeed, sometimes it is hours or even days before the hair standards are taken from the corpse. Thus, it is possible that the hairs exhibiting banding were removed from Mr. Weiss’ scalp more than 8-12 hours after his death, although I have no first-hand knowledge whether this is so. In the 26 years I have been actively following this issue since the trial, I have never seen, read, or heard about a case of postmortem hair banding occurring within less than 8 hours after death.

I testified as a prosecution witness in the Restivo and Halstead trial and as a defense witness in the 2005 retrial of John Kogut. I understand that the prosecution’s theory at the criminal trials and Nassau County’s theory in this civil case, is that the victim was raped in Mr. Restivo’s van, strangled to death in a Lynbrook Cemetery, and that the three defendants then proceeded to wrap the body in a blanket, place it in Mr. Restivo’s van, and drove it to a wooded area several blocks away where it was left -- and that the two Q-8 hairs at issue were inadvertently left behind while Theresa Fusco was alive or during the brief span of time before her body was removed from the van. The indisputable presence of postmortem banding in these hairs – an artifact that in my experience does not develop in hairs until at least 8 hours after death, and then only while still attached to a corpse – negates that theory and is contrary to the overwhelming weight of scientific observations over the last 26 years. The hair could not have been left by Theresa Fusco while

she was alive, nor could it have come from her body within a short time of her death, as I understand the prosecution argued in all three criminal trials.

Also, in reviewing these photocopies of the trial slides, the manifestations of banding on both of the Q-8 hairs and on the K hairs are consistent in appearance. This strongly suggests that this banding pattern occurred while attached to the decedent's scalp, after the decedent's death up to the time of her autopsy when it the K hairs were removed. Environmental conditions can affect the timing and degree of banding. But it is extremely unlikely, and probably impossible, that Q-8 hairs, if left in the van for four months, would have the same manifestations of banding as hairs known to have been removed from Fusco's scalp at the autopsy, given the brief period of time her body was allegedly in the van after her death.

*Pristine condition:* First, the two Q-8 hairs at issue which were later identified as coming from Theresa Fusco showed none of the debris, mechanical damage or breakage that is evident on the other questioned hairs collected from the van. (Compare Defs. Exh EEE and GGG (pristine) with MMM and OOO (damage). Ordinarily one would expect that hairs recovered from the floor of a van which had been there for over four months would display this sort of damage, in which the hair splinters as a result of the breakage of microfibriles in the hair, and collects debris such as dust, dirt and other particles from the surrounding environment. The other Q hairs (all but the two or three which were later found to have come from Theresa Fusco) said to have been collected from the van exhibited precisely this kind of breakage and debris. The fact that these two Q-8 hairs show no such damage or debris is not consistent with the theory that the Q-8 hairs were on the floor of the van for over four months. I expressed this opinion in an affidavit in 2003 and nothing has caused me to change it.

**Question 2: In or about 2003, the NCPD identified a third hair, this one from the Q4 envelope, as microscopically consistent with Theresa Fusco. Could this third Q hair, alleged to have been collected from the Restivo van in 1985, have been left by Theresa Fusco while she was alive or within a brief time after her death?**

**Opinion 2:** No. At the original 1986 trials, the prosecution put on evidence that, after reviewing all of the hairs collected from the Restivo van, Detective Charles Fraas had identified two hairs (both from the Q8 envelope) that were microscopically consistent with Theresa Fusco's hairs. I understand that the NCPD Detective Vito Schiraldi conducted additional microscopic comparison of the questioned hairs in preparation for the 2005 retrial of John Kogut, and that this testing identified one additional Q4 hair, also alleged to have been collected from the Restivo van, as microscopically consistent with Theresa Fusco's known hair standard. (Schiraldi '05 tr. 2007, 2015-16, 2018.) DNA testing established that the Q4 hair was in fact Theresa Fusco's hair.

I microscopically examined the Q4 hair at the NCPD Headquarters in the presence of Det. Schiraldi in 2005. Again, as with the Q8 hairs, the Q4 hair could not have been left in the Restivo van while the victim was alive, or within a short time after her death. The Q4 hair had no debris or breakage, which would be expected if the hair had been in a van for four months before it was collected. (Detective Schiraldi testified that his examination of the Q4 hair revealed that it had no breakage, only some dust, whereas other samples mounted by Detective Fraas in 1985 had breakage, fragmentation and debris. Schiraldi '05 tr. 2055-59, 2062-63.) Also like the Q8 hairs and the many of the hairs in the known standards collected from Theresa Fusco at the autopsy, the new Q4 hair exhibited post-mortem



hair banding. Again, this phenomenon only could have started to develop in hair attached to a corpse, and within my experience, at least 8 hours after death. And it is notable that the banding I saw on the Q4 hair was consistent with the banding on the Q8 hairs.

**Question 3: Noting the trial and deposition testimony from Detective Fraas that all the hairs in the case were kept in unsealed envelopes, filed either in unlocked cabinets or on open tables within the NCPD's Scientific Investigation Bureau (SIB), was this practice consistent with, or a departure from, generally accepted standards for chain of custody and preservation of evidence in 1985?**

**Opinion 3:** Det. Fraas testified that all of the hair samples he received in this case were in unsealed envelopes: known Fusco hair samples from the Medical Examiner and questioned samples from Det. Birdsall who had searched the van. (Fraas dep. 57-58.) Failing to secure evidence containing questioned hair samples from the crime scene and known hair samples removed during autopsy in sealed containers and unsecure facilities can cause or allow contamination and commingling of these specimens. One of the most important functions of a forensic scientist is to maintain the chain of custody of evidence collected at crime scenes and autopsies. Chain of custody is important to ensure both that the evidence tested is the same evidence that was collected, and to ensure that the evidence is not contaminated, accidentally commingled and/or tampered with – or even alleged to have been.

**Question 4: Please describe the generally accepted process for conducting microscopic hair examination as of 1985 – from collection of hairs through gross visual examination to mounting and microscopic comparison – and describe how long such a process would generally take for a reasonably competent, trained examiner.**

**Opinion 4:** I agree with the testimony of Det. Fraas and Det. Schiraldi when they state that the examination and comparison of human hair samples is a very time-consuming process which involves several phases. In 1985 the procedure for a complete human hair examination and comparison general involved the following steps which typically required from 3 to 5 days to several weeks to complete:

A. Assessment and Preparation of Questioned Hairs

1. Macroscopic examination (visual and stereoscopic)
2. Macroscopic examination is useful for observing characteristics such as: color, length, shape, contour of the hair, along with any adhering materials.
3. Mounting of hair on microscope slide in Permount®
  - a) Some examiners mount all hairs, one to a slide
  - b) Others mount multiple hairs on one slide

B. Microscopic Assessment

1. Microscopy
  - a) Light Microscope
  - b) Polarized Light Microscope

2. The procedure used by the hair examiner involved a thorough and careful examination of the microscopic characteristics exhibited by properly prepared hairs.
3. Questioned hairs were examined microscopically to determine:
  - a) if they originate from a human or another family of animals
  - b) if human, observing characteristics such as: color, length, shape, contour of the hair, along with any adhering materials
  - c) determine race, body area
  - d) suitability for comparison

#### C. Assessment and Preparation of Known Sample

1. From the known hair sample, the examiner selects hairs for comparison that represent a range of features.
2. The selected hairs are then examined and mounted in the same manner as those outlined for the questioned sample.
3. Of 100 hairs submitted, a number of hairs (usually 6 to 24), depending on their homogeneity) are selected by the examiner as representative of the entire known sample. The selection of these known hairs is based primarily on characteristics such as length, shape and color as observed by macroscopic and stereomicroscopic examination.
4. The selected known hairs are used for comparison with the questioned hairs.
5. The remaining hairs are available for future use if needed.

#### D. Comparison of Questioned and Known Specimens of Human Hair

1. If required, the hair examiner will identify the range of characteristics exhibited by the known sample and compare these characteristics on a side-by-side basis, from root to tip, with the questioned hair(s) on a comparison microscope

#### E. Possible Conclusions

1. The identification of race, body area and microscopic characteristics is the preliminary step in the hair examination process.
2. Meaningful hair comparisons are conducted between suitable questioned and known hairs from the same body area and with the same racial background.
3. If significant differences exist in the macroscopic and microscopic characteristics exhibited by the questioned and known hairs, the questioned hairs **cannot be associated** with the source of the known hairs.
4. If significant similarities exist in the macroscopic and/or microscopic characteristics exhibited by the questioned and known hairs, and the characteristics exhibited by the questioned hair fit within the range of the characteristics present in the known sample, then it can be concluded that the questioned hairs **may have originated from the source of the known hairs**.



5. **Inconclusive** results are obtained when the questioned and known hair samples exhibit both similarities and dissimilarities such that no meaningful conclusion about origin can be drawn.

**Question 5: Would any reasonably competent microscopic hair examiner have told anyone, based solely upon a gross visual examination of questioned hairs, that questioned hairs were “similar” to or “consistent with” known hairs?**

**Opinion 5:** No. Forensic hair examiners are trained to be careful in only reporting accurate results once testing is complete. This standard is consistent with what Detective Fraas testified to in his deposition, that he would not have reported to anyone that he had identified hairs consistent with the victim until he had done the gross visual inspection and mounted all of the questioned hairs, identified characteristics of each hair, mounted known hairs, and done a side-by-side microscopic comparison. “Consistent” is a term of art that hair microscopists use only after conducting a side-by-side microscopic comparison of known and questioned hair, in cases where, based on shared microscopical characteristics between the known and questioned hair, the microscopist determines that hairs could have a common source.

I declare under penalty of perjury, this 5<sup>th</sup> day of March, 2012, that the foregoing is true.



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NICHOLAS PETRACO

# Exhibit A



**NICHOLAS PETRACO**  
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**Amityville, NY 11701**  
**Cell: (516) 492-7882 – Fax: (631) 691-7595**  
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### **Education/Degrees**

- John Jay College of Criminal Justice (JJCCJ), M.S. in Forensic Sciences, (Terminal Degree) - June 1979
- John Jay College of Criminal Justice, B.S. in Analytical Chemistry - Feb. 1974
- Additional Undergraduate Majors in:
  1. Criminal Justice at New York City Police Academy and John Jay College of Criminal Justice, CUNY
  2. Secondary Education in Science & Technology Education Stony Brook University, SUNY and John Jay College of Criminal Justice, CUNY
  3. Over 80 Credit Hours in Fine Arts and Art History at FIT SUNY

Additional Specialized Training Courses in Forensic Science & Identification, over 2000 hours:

1. Examination & Comparison in Footwear and Tire Tread
2. Forensic Glass Examination
3. Gunshot Residue Analysis
4. Ballistics Examination
5. Tool Mark Examination
6. Fingerprint Examination and Comparison
7. Fingerprint Development
8. Hair and Fiber Analysis
9. Photography-Film and Digital

10. Crime Scene Examination
11. Crime Scene Reconstruction
12. Forensic Paint Analysis
13. Forensic Hair, Fiber and Textile Analysis & Comparison
14. Gemstone Identification
15. Post Blast Management
16. Forensic Paint and Pigment Identification
17. Light Microscopy
18. Electron Microscopy
19. Firearms Training: Hand Guns, Rifles, Shot Guns

- Numerous Education and Test Question Preparation Courses
- New York City Police Academy Recruit Training Program November 1968
- New York City Police Academy Detective Criminal Investigation Course 1982

### **Professional Work Experience**

- Present – Technical Leader/Supervisor for Criminalistics, Criminalistics, Trace Evidence and Hair and Fiber Sections NYPD Forensic Laboratory, Instructor FID Crime Scene Personnel
- **April 1990** to Present - Established Petraco Consulting - A Consulting business in Forensic Science & Criminalistics
- Performed as a Forensic Consultant, Forensic Microscopist and Instructor in Forensic Sciences for the following agencies and institutions as well as 100's of private clients
  - Innocence Project Cases in , New York, Tenn., Texas, New Jersey
  - UN Legal Team Attorneys Forensic Science Training, NYU Law School
  - Ethiopia Federal Police at the Federal Police Facility
  - Dominican Republic Federal Police Institution
  - Dominican Republic Legal Department UASD
  - NYPD Forensic Investigation Division
  - NYPD Crime Scene Unit

- NYPD Ballistics Unit
- U. S. Assistant Federal Attorney's Prosecutor Offices
- U.S. Federal Public Defender's Offices
- New York State Capital Defender's Office
- New York City Prosecutor's Office
- New York City Legal Aid Offices
- FBI Academy
- NYPD Forensic Investigation Division
- The State of Florida Capital Defender's Office
- The State of New Jersey's Capital Defender's Office
- The State of New Hampshire Public's Defender Office
- The State of Illinois Capital Defender's Office
- The State of Delaware Attorney General Capital Prosecutor
- The County of Suffolk, NY District Attorney's Office for Capital Cases
- The Smithsonian Institution
- The Metropolitan Museum of Art
- Saint John the Divine Textile Laboratory
- John Jay College
- National Law Enforcement Association
- Virgin Island US Federal Public Defender
- Numerous Private and Public Defense and Prosecuting Attorneys Offices
- Cardozo Law School, Innocence Project

**January 1999** to present: Contracted Forensic Consultant to New York City Police Dept. Forensic Laboratory Assignments:

- Technical Leader, NYPD Criminalistics and Trace Evidence Section
- Preparation of SOP for Trace Evidence Analysis and Criminalistics
- Training of new personnel in criminalistics, microscopy and Hair/Fiber Analysis
- Involved in the Preparation of Training Manuals and SOP's for Crime Scene, Footwear, Tool Mark Examination, Paint, Glass Analysis, Soil Analysis, Digital Photography, Hair and Fiber Analysis, Glass Examination, and Evidence Collection

- Training of new personnel in Footwear and Tool Mark Analysis
- Preparing and conducting Mock Trial Training Sessions
- Preparation of Digital Photography SOP and training personnel in digital photography
- Training Ballistics personnel in basic Microscopy and Tool Mark Examination
- Training new **Crime Scene Unit** personnel in collection and preservation of Physical Evidence
- Casework in trace evidence, hair and fiber analysis, textiles, tool marks and footwear examinations, explosive residues, soils, and comparisons
- Given expert witness testimony at trials
- Given lectures to outside groups, and agencies i.e., NYC Chief Medical Examiners

**July 1974** to April 1990 New York City Police Dept. Crime Laboratory/Detective Bureau: Duties as a **Detective 2nd Grade\Forensic Scientist**:

- Instrumentation & Criminalist Trace Evidence Section
- Senior Forensic Examiner from April 1982
- General Instrumentation & Criminalistics Analysis
- Trace Evidence: Paint, Hairs, Fibers, Glass, Soil, Minerals, Dust
- Gunshot Residue Analysis: Shooter's Hand and Muzzle to Target Distance
- Principal Operator SEM/EDXA-used in GSR, paints, soils and tool mark cases.
- Explosive Residues
- Footwear Examiner and Tire Tread Examiner
- Tool Mark Examiner - Physical Matches
- Latent and Patent Fingerprint Development: Used all methods including laser
- Forensic Photography Macroscopic



- Crime Scene Investigation and Reconstruction's
- Trained unit personnel – assigned, supervised and oversaw casework, signed reports
- Trained Outside Agency Personnel in: Hair/Fiber, Trace Evidence, Footwear, etc.
- Prepared: Hair Manual, Analytical Protocols
- Research and Development
- Ordered Capital Equipment and Trace Evidence Unit Supplies
- Prepared technical reports on results of analyses,
- Prepared NIJ Grants

**Worked** on thousands of criminal and civil investigations and testified as an expert witness over **500** times in State and Federal Courts in the following areas:

- 1) Trace Evidence: Glass, Soils, Paint, Dust, Minerals
- 2) Hair Examinations
- 3) Natural fibers, Synthetic Fibers, Textiles, Paper, Ropes and Cordage
- 4) General Criminalistics, Evidence Collection and Crime Scene Procedures
- 5) Light and Electron Microscopy
- 6) Tool Mark Examination
- 7) Footwear & Tire Tread Examination
- 8) Gunshot Residue Examinations Muzzle to Target Distance
- 9) Gunshot Primer Residue Examinations
- 10) Narcotics Analysis
- 11) Explosive Analysis
- 12) Wet Chemical & Instrumental Methods of Analysis
- 13) Inorganic Salts, Volatile Organics & General Unknown
- 14) Bullet Trajectory
- 15) Crime Scene Reconstruction

**November 1968** to July 1974 - **Police Officer** on precinct uniform patrol for 5 years

**February 1968** to Nov. 1968 - **Police Trainee** –Fingerprint Technician for Firearms Control Board, NYPD

## **Certifications**

- April 1993- Certified Criminalist, Diplomat of American Board of Criminalistics- Certificate #103
- February 1991- Certified NYS Science Teacher in Biology, Chemistry and General Science
- C14 Certificate to be in charge of Chemical Laboratory issued Jan. 1997 by NYCFD
- **Teaching Experience/Academic Appointments**
  - Appointed to John Jay College Science Dept. - Assistant Professor – Life Equivalent Background and Experience to PhD.- CUNY Committee on Staff and Administration – March 26, 2007 – Minutes page 4 (J.) Appointment with a Waiver of Section 11.11 of the Bylaws Lack of Ph.D.
  - Appointed to the PhD. Forensic Science Faculty Committee, CUNY Graduate Center, NY, NY, 2004.
  - Invited Lecture, FBI Academy, Quantico Virginia, Forensic Examination on various Occasions
  - Sir Winston Churchill Fellowship Preceptor for Ms. Debra Croft, University of London
  - Adjunct Associate Professor at St. John's University, Queens, NY, in Forensic Science for Criminal Justice Majors January 1990
  - Adjunct Assistant Professor Forensic Science, Criminalistics Laboratory, Instrumental Laboratory, Microscopy and Trace Evidence, John Jay College of Criminal Justice, CUNY, taught following courses from Sept. 1982 to present with several break in early 1990's:
    - Lecture and Laboratory Instructor Undergraduate:
      - Natural SCI 107 – Natural Science
      - FOS 108 – Forensic Science
      - FOS 320 – Instrumental Analysis
      - FOS 321 – Instrumental Analysis
      - FOS 720 – Advanced Instrumental Analysis
      - FOS 721 – Advanced Instrumental Analysis

- FOS 410 – Criminalistics Microscopy & Trace Evidence
- FOS 411 – Criminalistics Serology

➤ Lecture and Laboratory Instructor Graduate:

- FOS 710 – Advanced Criminalistics PLM/Trace Evidence
- FOS 711 – Advance Criminalistics Serology
- Instructor FOS 313 Impression Evidence
- Instructor for FOS 790 - Trace Evidence Analysis, PLM
- Instructor FOS 800 (Ph.D. Level) – Impression Evidence

Developed numerous instructional and training courses designed and given for NYC Police Department's: Detective Bureau, Crime Scene Unit, Forensic Investigation Division and Police Academy in criminalistics, forensic criminal investigation and crime scene investigation for:

- NY State University at Albany, Trace Evidence Graduate Instructor 2008
- NY State University at Albany, NERFI Forensic Science/Crime Scene Series, 2007
- State Education Dept. BOCES at NY State University at Albany, NERFI, 2006
- Dominican Republic National Police for John Jay College at John Jay College NYCPD Forensic Investigation Division Facility and National Police in Dominican Republic, 2006
- Training of DNA Analysts in Hair and Fiber Evaluation Penn. State Police 2004, and New York State Police 2006
- Training Instructor in Footwear Examination for NYPD Criminalistics Unit, Sept. 2001 to present
- Training Instructor in Digital Photography for NYPD Trace Evidence Unit, Sept. 2001 to present
- Training Instructor in Tool Mark Analysis for NYPD Firearms Section, Oct. 1997 to present
- Training Instructor in **Microscopy for NYPD Ballistics Unit**, Sept. 1997 to present

- Instructor in **Forensic Sciences for Criminal Investigation Course** given by the NYPD Detective Bureau, January 1983 to retirement
- Instructor in Forensic Sciences for **Homicide Investigation Course** given by the NYPD Detective Bureau, January 1985 to retirement
- Instructor in **Forensic Sciences Crime Scene Techniques** for NYC Crime Scene January 1982 to present
- January 1981 to retirement - **Instructor in Forensic Sciences for NYC Police Academy**, Distinguished Lecture, NYC Police Recruit Training Academy

### **Professional Affiliations**

- **Diplomat of American Board of Criminalistics (ABC)** – Prepare Test questions for ABC Trace Evidence General and Specialty Criminalistic Certification Examination on test national writing committee from 1985 to present
- **Fellow of the American Academy of Forensic Sciences - Criminalistics Section**, 1984
- **Fellow of the New York Microscopical Society** - Past Board Member, 1979 – 1985
- Member of the NEAFS, Board Director in 1980's

### **Awards**

- American Library Association for Life Sciences 2004 for book “Color Atlas and Manual of Microscopy for Criminalists, Chemists, and Conservators.”
- National Law Enforcement Association Award, 1989
- New York City Police Academy 1987 Distinguish Lecture's Award in Criminalistics
- Nikon Small World Contest Award Recipient, 1983
- Dean Hawley's Award for Scholarship, John Jay College, 1979

### **Miscellaneous**

- Member of **PhD Forensic Science Committee**, CUNY Graduate Center, NY, NY
- **Chairperson SWGMAT** Subgroup Hair- National Forensic Methods Standards Committee sponsored by the **Dept. of Justice, FBI**. Jan. 1996 to Jan. 2001
- Committee **Member 1<sup>st</sup> Forensic Hair Group, FBI**, Oct. 1983 to 1986
- Technical Advisor for “American at Home” an educational television documentary series created by Dr. Hugh R. Crean, Chairman Restoration Dept. FIT, and Don W. Walters, Project Director
- Section Chairperson (Microscopic Analysis) Eastern Analytical Symposium, Summerset, NJ, Fall 1993
- American Board of Criminalistics (ABC) Specialty Examination - Content Specialist for the Certification Proficiency Test - Prepare Protocol & Test Questions for National Certification Examination.
- NEAFS Chairperson for Hair and Fiber Peer Group ABC Certification Test Committee - Prepared
- Member of ad hoc committee on Forensic Hair Comparison formed by the FBI to standardize Forensic Hair Examination
- Guest Reviewer for the Journal of Forensic Science
- Reviewer of Research Proposals for the Forensic Science Research and Training Center, FBI Academy
- Reviewed Research Grant Proposal for CUNY Graduate Research Center.

## **Media Experience**

- Movie Consultant
- Mystery Writer Consultant
- Newspapers & Magazines
- Court TV
- History Channel
- CBS
- ABC
- Nova
- Discovery Channel
- CSI New York
- New York Times
- McCall's Magazine

- People Magazine

### **Some Cases of Note**

- Wendy's Homicide
- Son of Sam
- John Lennon
- Metropolitan Opera
- FALN Bombings
- BLA Shootings
- SDL Bombings
- World Trade Center
- Statue of Liberty Bombing
- Columbine
- Terrorist Bombings
- Angela Davis
- Lufthansa Robbery
- Brinks Robbery
- Pizza Connection

### **Publication**

Member of Forensic Science Journal Editorial Board, Department of Forensic Science, Central Police University, Taiwan ROC

Presentations 100's of papers, poster sessions at scientific meetings, workshops and scientific symposia and training classes for the following groups or organizations:

- Eastern Analytical Association
- American Academy of Forensic Scientists
- Northeastern Association of Forensic
- FBI Academy
- New York Microscopical Society
- Dr. Henry Lee Institute of Forensic Science
- New Haven University, Conn.
- John Jay College, CUNY
- New York University
- Columbia University



- Fordham University
- St. John's University
- NYC Chief Medical Examiner's Office (OCME)
- Manhattan Legal Aid Society,
- New York Microscopical Society,
- Cardozo Law School
- Various D.A.'s Offices
- Various Legal Aid Societies
- Various Federal Prosecutors
- National Law Enforcement Groups
- Professional Security Agencies, Military, Police and Investigation Groups
- NYC Police Dept. Police Academy
- NYPD Detective Bureau
- NYPD Crime Scene Unit
- SUNY Albany
- NERFI

***Published Text Books Authored and Co-authored:***

1. Color Atlas of Forensic Tool Mark Examination, Taylor Francis Boca Raton, FL, Sept. 2010
2. Forensic Science – Laboratory Experiment Manual and Wookbook, Taylor Francis, Boca Raton, FL., totally revised 3<sup>rd</sup> edition, 2009.
3. Forensic Science – Laboratory Experiment Manual and Wookbook, , Taylor Francis, Boca Raton, FL., totally revised 2<sup>nd</sup> edition, March 2005
4. An Illustrated Guide to Crime Scene Investigation, CRC Press, Boca Raton, FL., June 2005
5. Color Atlas and Manual of Microscopy for Criminalists, Chemists, and Conservators, CRC Press, Boca Raton, FL. January 2004
6. Forensic Science – Laboratory Experiment Manual and Wookbook, , CRC Press, Boca Raton, FL., 1<sup>st</sup> ed. Sept. 2003

7. Chemical-Instrumental Analysis for Forensic Scientists, Laboratory Manual, 4<sup>th</sup> Edition, 2000.

***Published Book Chapter, Contributions and CD's, Authored and Co-authored:***

- 1) A Guide to the Analysis of Forensic Dust Specimens, Chapter 2, in Forensic Science Handbook, Volume III, 2<sup>nd</sup> edition, R. Saferstein, editor, Prentice-Hall, NJ, 2009.
- 2) Microanalysis and Examination of Trace Evidence,” Chapter 14 in Forensic Science – An Introduction to Scientific and Investigative Techniques, James. S.H. and Nordby, J.J., Editors, CRC Press/Taylor Francis, Boca Raton, FL, 1<sup>st</sup> ed. 2003, 2<sup>nd</sup> ed. 2005, 3<sup>rd</sup> ed. 2009.
- 3) Criminalistics - An Introduction to Forensic Science, R. Saferstein, 3rd ed., 4<sup>th</sup> ed., 5<sup>th</sup> ed., 6<sup>th</sup> ed., 7<sup>th</sup> ed., 8<sup>th</sup> ed., 9<sup>th</sup> ed., Prentice-Hall, NJ, 1987 to 2008.
- 4) Human Hair Atlas, Ogle and Fox, Atlas of Human Hair – Microscopic Characteristics, CRC Press, 1999.
- 5) Atlas of Human Hair, CD Rom., SWGMAT, Hair sub-committee, 2001.
- 6) Forensic Hair Examination Guidelines, Hair Subgroup, SWGMAT, Washington, D.C., April 2004.
- 7) Forensic Dust Analysis, History of Forensic Science, Chapter 4, Ed. S. Gerber, American Chemical Society, Washington, DC, August 1997.
- 8) A Guide to the Analysis of Forensic Dust Specimens, Chapter 2, in Forensic Science Handbook, Volume III, R. Saferstein, editor, Prentice-Hall, NJ, 1<sup>st</sup> edition 1993, and 2<sup>nd</sup> edition April 2009.

***Journal Articles Authored & Co-authored:***

- 1) The Statistical Significance of the Household Dust Specimens, AAFS Meeting in Chicago, IL. Paper No. 155, Feb. 2011.
- 2) Forensic Surface Metrology-Tool Mark Analysis, Scanning, submitted Jan. 2011.

- 3) Addressing the National Academy of Sciences Challenge- A Method for Statistical Pattern Comparison of Striated Toolmarks, JFS submitted Dec. 2010.
- 4) World Trade Center Dust, Paper No. A180, AAFS meeting in Denver CO., Feb. 2009.
- 5) Statistical Discrimination of Footwear: A Method for the Comparison of Accidentals on Shoe Outsoles Inspired by Facial Recognition Techniques, Journal of Forensic Sciences, Jan. 2010, 55, No. 1, pp. 34-41.
- 6) The Statistical Significance of the Aggregated Trace Evidence Found in Household Dust Specimens, NIJ Trace Evidence Symposium, Post Session, Aug. 2009.
- 7) Preparation of Toolmark Standards with Jeweler's Modeling Wax, Part 2, in Journal of Forensic Science, vol. 54, No. 2, March 2009, pp. 353-58.
- 8) Case Studies in Forensic Soil Examination, Forensic Science International, vol. 178, No. 2-3, July 2008, pp. e23-e27.
- 9) An Ideal Material for the Preparation of Known Toolmark Test Impressions - Part 1, Journal of Forensic Sciences, 50, No. 6, pp.1407-10.
- 10) Analysis of WTC Dust, NIJ Trace Evidence Symposium, Post Session, July 2007.
- 11) A Comparison Study of Hair Examination Methodologies, Journal of Forensic Sciences, 49, No. 6, pp 1253-55.
- 12) The Confirmation of (Architectural) Layer Determination by Micro-Diamond ATR, AAFS meeting, Dallas Texas, Feb. 2004.
- 13) Forensic Human Hair Identification and Comparison Guidelines, Poster B62, AAFS meeting, Seattle, Washington, Feb. 2001.
- 14) "A Density Gradient Technique for Use in Forensic Soil Analysis, Journal of Forensic Sciences, 45, p. 872, 2000.

- 15) Forensic Fiber Examination Guidelines, Fiber Subgroup, TWGMAT, Washington, D.C., 1998.
- 16) A Casework Proven Method for the Analysis of Forensic Soil Specimens, Poster, FBI Symposium, San Antonio, Tex., June 1996.
- 17) Gemological Abstract, Gems & Gemology, Vol. XXX1, Spring 1995, p. 290.
- 18) The Enhancement of Fine Two Dimensional Residual Soil and Dust Footwear Prints Encountered on Low Contrast Surfaces, Poster, FBI Symposium, Quantico, Va., June 1994.
- 19) Microscopic Examination of Mineral Grains in Forensic Soil Analysis: American Laboratory, Part 1, 26(6) 1-68 April 1994, pp.35-40.
- 20) Microscopic Examination of Mineral Grains in Forensic Soil Analysis: American Laboratory, Part 2, 26(14) 1-64 Sept1994, pp.33-35.
- 21) Gemological Abstract, Gems & Gemology, Vol. XXX, Winter 1994, p. 290.
- 22) A Technique for Comparing Soil Colors in the Forensic Laboratory, Journal of Forensic Sciences, 38. No. 2, March 1993, pp. 437-41.
- 23) Trajectory Reconstructions I. - Trace Evidence in Flight, Journal of Forensic Sciences, 35, No. 6, Nov. 1990, pp. 1284-96.
- 24) The Morphology and Forensic Significance of Human Hair Roots, Journal of Forensic Sciences, 33, No. 1, Jan. 1988, pp. 68-76.
- 25) Plastic Slide Crossectioning Technique, Micro-Notes II, 9, No. 1, Jan. 1987, pp. 26 & 27.
- 26) A Method for the Rapid Screening and Identification of Synthetic Fibers in Dust, JFSCA, 32, No. 3, May 1987, pp. 768-77.
- 27) A Simple Trace Evidence Trap for the Collection of Vacuum Sweepings, JFSCA, 32, No. 5, Sept. 1987, pp. 1422-25.

- 28) A Microscopical Method to Aid in the Identification of Animal Hairs, The Microscope, 35, No. 1, Winter 1987, pp. 83-91.
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- 34) Trace Evidence, Micro-Notes II, 8, No. 2, July 1986, pp. 15-21.
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- 36) Trace Evidence - The Invisible Witness, Journal of Forensic Sciences, 31, No. 1, Jan. 1986, pp. 321-28.
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- 39) A Computerized Human Head Hair Database, Journal of Forensic Sciences, 24, 1984, p. 451.
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- 42) The Use of Cross Sections in Forensic Fiber Examinations, Crime Laboratory Digest, Dec. 1983, pp. 1& 2.
- 43) Chemistry and the Challenge of Crime, Chapter 5 in Chemistry and Crime, Ed. Samuel M. Gerber, American Chemical Society, Washington, DC, 1983.
- 44) A Rapid Method for the Preparation of Transparent Footwear Test Prints, Journal of Forensic Sciences, 27, No. 4, Oct. 1982, pp. 935-37.
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- 47) A Modified Technique for the Cross-Sectioning of Hairs and Fibers in Forensic Cases, Journal of Police Science and Administration, 9, No. 4, Dec. 1981, pp. 448-50.
- 48) An Interesting Arson Case Involving a Plastic Fingerprint, Identification News, XXXI, No. 6, June 1981, p. 9.
- 49) Fiber Optics Illuminator for use in Dispersion Staining, The Microscope, 28, 1980, pp. 51-55.
- 50) Interesting Evidence Find in New York, Crime Laboratory Digest, FBI, Washington, DC, December 1980, pp. 11-13.
- 51) A New Approach to the Microscopical Examination and Comparison of Synthetic Fibers Encountered in Forensic Science Cases, Journal of Forensic Sciences, (JFSCA), 25, No. 3, July 1980, pp. 571-82.

## REFERENCES



1. Dr. Henry C. Lee, Henry Lee Institute, University of New Haven, (203) 932-7460
2. Dr. Thomas A. Kubic, Professor of Forensic Sciences, John Jay College, Tel., (212) 237-8891
3. Dr. Lawrence Kobilinsky, Chairperson, Science Dept., John Jay College, (212) 237-8884

# Exhibit B

①

10/29/86

1030 hrs.

B-356-84

Q8 -  
(A)

Common hard hair

L + B 12mm

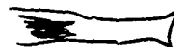
Tip 

P. most fine - even distribution

Cuticle Serrated - toward base - Mark

Medulla - absent - Marginal Med. Cells

Root - C.F. bent + R.



air space around  
C.F. - Dark Zone

Shift - Thickness 60-70um -


X-5 O

B-386-84

(2)

Q<sub>8</sub> - Carcass head hair  
(B)

Lt. Brown

TIP  freeze

Pigment fine - Curved distal

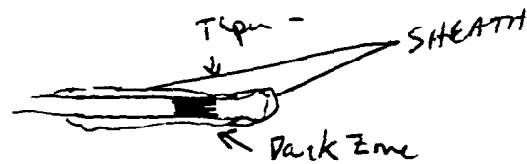
cuticle Same median diameter

terminal dip - Mayan Mid Chan

medulla absent - C. f. head

Root

New root



Shaft thickness - R - 40-80um

X-50

(3)

B - 386 - 87

10/28/86

K. #1 + Q<sub>8A+B</sub>  
Rout Cutg.

#2 C-?

Rout Cutg.

#3 Rout Degrad. - lib<sup>14</sup>+ Q<sub>8A+B</sub>

#4 Rout ( ? )

#5 + Q<sub>8A+B</sub>Rout Deg. Rout lib<sup>14</sup>

#6 Rout Deg.

+ Q<sub>8A+B</sub>

#7 Rout # (?)

+ Q<sub>8A+B</sub>

#8 - Rout Deg.

Some seen to Q<sub>8A+B</sub>

Tip - cut - #1, 2, 3, 4, 5, 6, 7, 8

9, 10, 11 - 3x, 12, 13, 14, 15

16, 17, 18, 20.

(4)

8-386-84

10/28/86

K<sub>1</sub>#7 + Q<sub>8A+B</sub> -  
Root Dye. (T) -#10 (-) falls in Rm.  
Root Dye.#11 Root Tely. -  
Hair from the Q<sub>8A+B</sub>.  
Cable Chem -#12 -(+) Q<sub>8A+B</sub> -  
Root dyed - ROOT DEGRADED#13 -(+) Q<sub>8A+B</sub>  
Root started to dyed STARTED  
TO DEGRADE#14 -(+) Q<sub>8A+B</sub>  
Root dyed ROOT DEGRADED#15 - F.R. -  
Root (?)#16 -(+) Q<sub>8A+B</sub>



(5)

B - 386 - 84  
10/28/86 -

#16 bet

Root decayed -

#17 (+) P<sub>8A+B</sub>

Root Tel -

Heir delin

#18 - (+) P<sub>8A+B</sub>

Root Tel

Heir delin

#19 probably from Van

cont ext - Broken

Splinted, Dirty

light colored

(Dent)

#20 - (+) P<sub>8A+B</sub>

Root decayed -

Other Q from Delin

looked normal for

Dent -

Cheon Weese - Nassau

11/1/12

Nov. 1, last seen in room

1:30 found 6:30 am

to me.

Autopsy Nov. 1, 1986

1400 hours

8-12 hours - Hair removed -

Facial injury -

Stabbed per. eye in face  
while asleep.

Cortney Steel  
F/C 117

10/19/86 - D&A

S + Mark by auto - Head + Face  
3:15 AM 10/19/86 mrg.

Autopsy - 1400 10/19/86  
10:12 hrs

M86-8808

---

Jennifer Turner  
F/C 177 M86-7214

Strangled -

8/26/86 found 6:30 -

Remained 9:30 by M.E. in  
Park - to Morgan

Autopsy 8/27/86 10 AM

